UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF PUBLIC ROADS AND RURAL ENGINEERING
Washington, D. C.

FIELD LETTER NO. 25.
March 15, 1917.

Logan Waller Page, Director.
P. St. J Wilson, Chief Engineer; J. E. Pennybacker, Chief of Management; Samuel Fortier, Chief, Irrigation Investigations; S. H. McCrory, Chief, Drainage Investigations; E. B. McCormick, Chief, Rural Engineering; Prevost Hubbard, Chief, Tests.

FEDERAL AID

Projects Nos. 1 and 2, submitted by the State Highway Department of Pennsylvania, have been approved by the Secretary and the project agreements have been prepared for execution by the State Highway Department and the Secretary. These projects are post routes throughout their entire length.

No federal aid projects were received at the Washington Office in January and February. This is due largely to the fact that many legislatures are in session working on amendments or new laws affecting State highway departments and federal aid cooperation. In other States, project statements and the plans therefor are being prepared as a part of the winter's program of office work. Some of these have been submitted to the district engineers and are being put in shape for transmittal to the Washington Office.

Of the forty-one state legislatures that met in January a few have adjourned and a number will adjourn in March. An immense amount of road legislation is pending in the several States, much of which will be enacted into law during the next few weeks. Much of this legislation will be in the nature of amendments to existing law, but there will also be considerable new legislation. The Legislature of South Carolina has adjourned. Before adjournment it enacted a law creating a State Highway Commission, to consist of the senior professors of civil engineering at the University of South Carolina, at Clemson College, and at the South Carolina Military Academy, and two other members, to be appointed by the Governor. This Commission is to appoint a State Highway Engineer, whose salary is limited to not exceed $3,000, to be fixed by the Commission.

Conditions continue to indicate that project statements will arrive in Washington in large numbers in the early spring. Statements for both the fiscal year 1917 and 1918 will begin to arrive at the same time. On account of the anticipated rush and the lateness of the season, it will be advisable to get project statements and plans to the Washington Office as early as possible to avoid delays and assist the State highway departments in getting their first year's construction under way.

The recent ruling of the United States Attorney General on various phases of the postal route question is permitting activity on a number of projects which have been held up pending thesettlement of this important matter.

It will be necessary in the case of every proposed federal aid project to obtain definite and reliable information on the exact locations of all parts of the proposed projects which are used as post routes and on those portions which are not so used. Also information bearing upon the question of whether or not there is a reasonable prospect that the portions not now used as a post route may be so used within a reasonable time after the project may be constructed.

The standards to be promulgated governing the form of plans, specifications and estimates to be submitted have been considerably modified and enlarged. They are still a subject of negotiation between this Office and the Committee of the American Association of State Highway Officials. No changes in the size of plans or scales mentioned in the last field letter are expected.

The States, for which no rulings as to status under the Federal Aid Road Act had been made February 1, have now been considered by the Department and the rulings made. Five of these, however, have not at this time been approved by the Secretary, but are before him and may be approved any day. This will complete the determination of the status of the several States relative to cooperation under their highway laws with the Department under the provisions of the Federal Aid Road Act.

L. Y. Hewes, District Engineer, has given considerable attention to the various committees of the Legislature of Oregon in the interest of the new highway legislation. A new highway department has been created and an act passed authorizing a $6,000,000 road bond issue.

The legislature of Wyoming created a new State Highway Department and prepared for federal cooperation. The legislatures of Montana, Utah and Colorado are still in session. The Utah Legislature has authorized a $2,000,000 State highway bond issue.

J. D. Fauntleroy, District Engineer, has been in conference with the legislators of Texas, Arkansas and Oklahoma, concerning State Highway legislation and federal aid cooperation.

FOREST ROADS. - A number of forest road plans are in course of preparation or nearing completion in Districts 1, 2 and 3, where there will be much activity in the making of surveys and plans during the year and considerable construction work. Construction work in general will not get under full headway until the working season of 1918, when it will be possible to execute the work for which surveys and plans will be made during the present season.

J. A. Whittaker, District Engineer, has been engaged in the inspection of forest road projects in preparation at Missoula, Denver and Ogden

OBJECT-LESSON ROADS

On February 16, F. A. Davis, J. H. E., proceeded from Bowling Green, Kentucky, to Henderson, Kentucky, to take charge of making a survey and the preparation of plans and specifications for the improvement of 9 miles of earth road in Henderson County.

EXPERIMENTAL ROADS

Montgomery County, Maryland, roads are in very good condition but the open winter, with frequent freezing and thawing will make it necessary to do considerable work as soon as the season will permit.

Alexandria County, Virginia, roads are in good condition, but some sections will need attention when weather permits.

Fairfax County, Virginia, roads are in first-class condition, with the exception of the 600 feet of asphalt-soil road and the 3 sections of surface treated gravel road between Gum Spring and Mount Vernon. The asphalt-soil road never got dried out, as freezing weather occurred the day after the last section had been placed. In consequence, it became necessary to scrape this asphalt soil from the gravel base. The 3 sections of surface treated road between Gum Spring and Mount Vernon broke through and have required dragging. All of these sections will need attention early.

COUNTY ROAD SYSTEMS.

E. S. Alderman, J. H. E., completed a report outlining a system of roads for Beauregard Parish, Louisiana, on February 3, and was assigned temporarily to assist District Engineer Fauntleroy. Under the direction of the District Engineer he has inspected and reported on systems of roads for Montague, Clay and Wise Counties, Texas. Mr. Alderman began a 90-day furlough the first of March, during which time his address will be DeRidder, Louisiana.

B. H. Burrell S. H. E., has been assigned temporarily to assist District Engineer Fauntleroy. He completed the inspection of the roads of Crosby County, Texas, and will report on a county system. He will continue on similar work in other counties in Texas.

H. K. Craig, H. E., is still assisting District Engineer Fauntleroy. He prepared county system reports for Williams and Travis Counties, Texas, and inspected the roads of Howard, Reeves, Callahan and Johnston Counties, Texas, for the purpose of preparing reports on county systems.

ROAD MAINTENANCE

Washington-Atlanta Highway: - On February 10, G. D. Marshall, S. R. C., relieved G. C. Scales, S. H. E., in the maintenance work on the Washington-Atlanta Highway. Mr. Scales has been permanently assigned to assist E. O. Hathaway, District Engineer of District No. 4. Mr. Marshall reports the Highway in Georgia, owing to continued inclement weather, to be in rather bad condition, although construction work is still going on in some counties.

V. E. Towles, H. E., reports that frost action has softened the road in many places, rendering immediate repairs necessary on his section. Arrangements were made to have the Highway across Harnett County, North Carolina, dragged.

Granville County, North Carolina, renewed its application for maintenance for another year, and resumed patrol service on its roads.

Central Highway: - Mr. Spoon reports the following conditions on his section: The greater part of Orange County impassable; from Mebane to Greensboro the road is open except in Burlington and in Gibsonville; from Greensboro to Statesville, via the Post Road, there are many broken sections; via Lexington and Salisbury it is passable except in High Point; from Salisbury to Cleveland the road is in passable shape, but from Cleveland to Elmwood it is impassable and will be so for many weeks, as it is under construction. As soon as the weather clears and rains cease, it will take only a very short time to place the roads in good, passable condition.

IRRIGATION INVESTIGATIONS.

In 1890 Mr. Fortier designed and constructed a system of water works for Ogden, Utah, which cost approximately $400,000. It now appears that the city is in need of an additional supply of water, and at the request of the mayor Mr. Fortier has submitted a preliminary report in which he recommends the building of a storage reservoir on a tributary of Ogden River, the dam to be of the arch type and to be built of concrete, about 200 feet high, and to cost about $110,000. He has also submitted to the city officials a preliminary report on the disposal of the city sewage by means of sewage irrigation.

At the request of Mayor Stevens, of Vineland, N. J., Mr. Fortier made a trip to that city to investigate sewage irrigation in connection with the contemplated construction of a new outfall sewer. In company with G. A. Mitchell, Agent, he also visited the sewage irrigation plant at Spring City, Pennsylvania.

J. T. Kingdon, I. E., has severed his connection with the Department to take up work outside the government. For the past two years Mr. Kingdon has been in charge of the investigations in Wyoming, and has also carried on a study of chutes and drops used in irrigation systems.

Irrigation in Florida, by F. W. Stanley, I. E., was issued by the government printing office February 16 as Department Bulletin No. 462. Spray Irrigation, by M. B. Williams, I. E., was issued February 14 as Department Bulletin No. 495.

PUMPING FOR IRRIGATION.

C. G. Haskell, I. E., has been detailed to assist in the investigations started last month in Victor Valley, California by C. E. Tait, I.E., his studies being concerned with the underground water recourses of the valley. The purpose of the Victor Valley surveys is to determine the area which may be included in the proposed irrigation district there. The reclamation of the valley will involve high expense, and the feasibility of present plans will depend upon the duty of water and the extent of the section which might be included in the district.

The pump at the Carden City, Kansas, experimental plant was pulled during February by H. C. Diesem, I. E., and G. S. Knapp, Agent, and the well was deepened, resulting in a somewhat heavier flow when the pump was again installed. Legislation pending in the Kansas legislature will, if enacted, permit extensive improvements in the plant, which is considered out of date in several respects.

Customs, Laws, and Regulations.

At the request of members of the South Dakota legislature H. C. Diesem, I. E., and Frank Adams, I. M., have reviewed pending legislation in that body to provide for the organization of irrigation districts. The law now proposed follows closely the provisions of the Nebraska law, conditions in the irrigated sections of South Dakota being similar to those in Nebraska. Suggested improvements in the first draft of the bill have been made by both Mr. Diesem and Mr. Adams.

Use of Water.

Copies of letters received from the field relating to improvements which might be made in the type of water register at present used in duty of water work were handed to a representative of the firm manufacturing these instruments during a visit which he paid to the Washington Office late in February, with the expectation that suggestions which seemed practical might be adopted in the manufacture of such instruments of the same type as may be purchased in the future.

TESTS AND RESEARCH

Projects:

Administration. - H. S. Fairbanks, Highway Engineer, was transferred in February from the Division of Road Economics to the Division of Road Material Tests and Research to assist Mr. Goldbeck in concrete and soil-pressure investigations.

Josef Gendt, of Stockholm, Sweden, and I. B. Mullis, of the North Carolina Highway Commission are taking courses in the Office laboratories.

Mr. Hubbard inspected the testing laboratory of the Pennsylvania State Highway Department at Harrisburg, and found the equipment and methods to be well up-to-date and far in advance of most of the State Highway Commissions.

A Conference of State Highway Testing Engineers and Chemists was held by the Office at Washington, D. C., the week of February 12, for the purpose of formulating and recommending standard forms of specifications, tests, report forms, and methods of sampling for various types of road materials. Twenty-six representatives from 21 states attended, together with 6 representatives of the Office. After a general meeting the Conference was split into a number of committees to consider different types of materials and tentative reports of these committees were submitted at a mid-week general meeting. Final reports were presented on the last day of the Conference and many of the recommendations were adopted. The results of this Conference have been embodied in a mimeographed report which engineers of the Office and other interested persons secure upon application. It is also proposed to publish the report as a Department Bulletin. The report deals with the following materials as applied to various uses in road work: top-soil, sand-clay, semi-gravel, sand, gravel, broken slag, broken stone, Portland cement, Portland cement concrete, steel reinforcing rods, vitrified paving brick, road oils, asphalt cements, and refined tars.

Routine Tests and Analyses.

Eight samples of bituminous material were examined in the chemical laboratory in February; fifty-seven samples of rock, sand, gravel, etc., were examined in the physical laboratory, and seventy-five samples were examined and classified in the microscopic laboratory.

Research Upon the Properties of Dust Preventives and Road Binders.

Work was resumed upon a study of the effect of controllable variables upon the float test, with particular reference to the effect of varying outside temperature. This is a continuation of some work started along similar lines last year but which had been abandoned temporarily.

The laboratory has secured several of the ball and ring melting point apparatus recommended by Committee D-4 of the American Society for Testing Materials, and comparative tests are being made on back samples of material to secure some definite relation, if possible, between the results obtained by this method and those obtained by the cube method.

Further work on the new viscosity tester for viscous liquid bituminous materials has resulted in a modification of the apparatus previously thought satisfactory, making it much more serviceable and less liable to injury during operation.

Work has been resumed upon the study of the thickness of bituminous films on different types of mineral aggregates.

Nonbituminous Road Material Investigations.

A large number of additional tests were made on samples of gravel submitted by Columbia University for the purpose of comparing the American Society of Civil Engineers, the Ohio State, and the Office of Public Roads abrasion tests.

Additional work was carried on in connection with the effect of controllable variables upon the toughness test. It seems to indicate that the allowable limits in diameter of the test specimen should be from 24 to 25 mm. instead of from 23 to 25 mm. as reported in the last Field Letter.

The report presented before the American Society of Civil Engineers in January, upon impact tests on sections of brick pavement, was published in the Engineering News, and brought forth considerable discussion. These tests are being continued and two test specimens constructed with a bituminous sand cushion and bituminous filler were tested during the month. The behavior of these sections under test was very similar to the plain sand cushion specimens previously reported.

Experimental Bituminous Road Construction and Maintenance.

Mr. Reeve cooperated with Mr. James in the inspection of all experimental roads in Montgomery County, Md. for the purpose of preparing the Annual Progress Report for 1916.

The experimental soil-asphalt section of the Alexandria-Accontink Road has continued to be unsatisfactory, due to the fact that it never has dried out thoroughly, and some work has been required on the section.

Concrete Investigations.

The following papers were presented before the American Concrete Institute: The Influence of Total Width on the Effective Width of Reinforced Concrete Slabs Subjected to Central Concentrated Loading, by Mr. Goldbeck;

Friction Tests of Concrete on Various Supporting Materials, by Mr. Goldbeck; and The Flow of Concrete, by Mr. Smith.

Soil-Pressure Investigations.

Considerable attention has been devoted to the measurement of distribution of pressure through earth fills, and the results so far obtained at Arlington Farms give promise of an early solution of the problem. It is expected that a paper giving the preliminary results will be prepared within the next few months.

RURAL ENGINEERING

The following designs, plans, bills of materials, and specifications have been completed:

Combined sheep barn and laboratory at Beltsville for the Bureau of Animal Industry.

Dairy barn, stock shed and milk house for Huntley Field Station, Montana, for the Bureau of Plant Industry.

Herdsman's house for the Ardmore Field Station, South Dakota.

Work has progressed on bills of materials for various sizes of wooden hoop silos. Drawings and bills of materials for single row hog houses are nearing completion.

The revision of plans and specifications for a skylight hog house previously prepared by this Office for general distribution is now in progress for the Division of Animal Industry for the Huntley Field Station project.

Several drawings have been completed and others are in the course of preparation for laboratory equipment of the Bureau of Chemistry.

Various bills of materials for previous miscellaneous designs have been completed and others are in the course of preparation.

Preliminary designs have been prepared for the front elevation of the laboratory building to be built by this Office at the Arlington Farm.

Structural and mechanical designs have been prepared for the remodeling and partial equipment of a building for the Bureau of Chemistry at Arlington Farm.

Circular No. 72, prepared by E. B. McCormick on width of wagon tires recommended for loads of varying magnitudes on earth and gravel roads, has been issued and is now available for distribution.

Reprints of the Year Book article "Sewage Disposal on the Farm" by W. M. Warren are available for distribution.

Work has been started on the preparation of a bulletin on "Farmstead Planning."

A series of reinforced concrete cisterns of varying capacity for farm use is in course of preparation.

The collection of data relative to various types of water wheels suitable for hydroelectric plants for farm work has been started.

Correspondence continues to increase along the following lines, all of which have received attention, and assistance has been rendered in so far as the facilities of the Division have permitted.

General architectural and construction problems.
Water Supply and Sewage Disposal.
Refrigeration and ice-house design and construction.
Farm light and power plants.
Power development from streams.
House heating systems.

and other problems of a general and miscellaneous nature.

DRAINAGE INVESTIGATIONS.

Administration.

During the week ended February 10, S. H. McCrory, accompanied by H. H. Barrows, inspected the ditches in Back and Jacobs Swamps, Little and Big Sugar Creeks, Buffalo Creek, and Third and Fourth Creeks Drainage Districts, North Carolina, with a view to selecting suitable ditches on which to conduct ditch maintenance investigations. Upon the completion of this inspection Mr. McCrory returned to Washington, while Mr. Barrows proceeded to Georgia where, in company with J. V. Phillips, he inspected various drainage improvements. While in Atlanta they conferred with Dr. S. W. McCallie, State Geologist, relative to a report on "Agricultural Drainage in Georgia" to be published by the State Geological Survey. From Georgia Mr. Barrows proceeded to South Carolina, where he inspected improvements on the Ashley Hall Plantation and the Combahee Corporation Tract, accompanied by Mr. Eason on the former and Mr. Okey on the latter project.

From February 21 to March 4, Mr. McCrory conferred with Messrs. Jones, Ramser, Staebner, Eason and Okey concerning the respective projects assigned them.

With the close of February, E. W. Grimmer, (J. D. E.) terminated his relations with the Department.

Guy L. Smith, W. B. Booth and A. L. Lane have been appointed as Junior Drainage Engineers. For the time being, Mr. Smith will assist Mr. Lynde in North Carolina, Mr. Booth will assist Mr. Baxter in Arkansas, and Mr. Lane will assist Mr. Ramser in run-off work in Tennessee.

FARM DRAINAGE

S. W. Frescoln returned to the Washington Office February 11, and is now engaged in preparing reports on the Cooper and Dabbs-McBride Tracts.

On March 9, Guy A. Hart left Montgomery for various points in Mississippi to give attention to requests received through the Mississippi Agricultural College.

Fred F. Shafer spent the greater portion of February in the Office except for a several days' trip to Virginia. On March 14 he left for the middle west where, after attending to a few requests from farmers, he will collect data on vertical drains and on small ditching plows. The investigation will extend several months.

L. T. Jessup continues supervision of constructing drains in the Palisades Drainage District, Colorado.

W. A. Kelly, besides continuing work on his report of investigations in the Yakima Valley, Washington, has made two trips to western counties of the State to assist individual landowners and small drainage districts. Humid conditions prevail in those counties.

The following prices for tile were obtained recently by W. N. Hall and Fred F. Shafer:

PRICES OF TILE

Factory Location	F.O.B. Location	4"	5"	6"	7"	8"	10"	12"
National Fire Proofing Co., Pittsburgh	Masontown, W. Va.	$24.48	$36.60	$43.60		$70.00		
Janelew Tile Co., Janelew, W. Va.	Janelew, W. Va.	20.00	25.00	35.00		60.00		
Forrest and Co., Ohio	Belleville, W. Va	19.40						
E. Biglow Co. New London, Ohio	Sistersville, W. Va.	20.90	28.65	37.20	47.50			
Elkins Brick and Tile Co., Elkins	Elkins, W. Va.	16.00	22.00	30.00	45.00	56.00	$80.00	$120.00
Chattanooga Sewer Pipe and Brick Co., Chattanooga, Tenn.	Chattanooga, Tenn	15.00	23.00	30.00				
E. Biglow Co. New London, Ohio	Pennsboro, W. Va.	22.60	30.50	39.50	50.00	65.00		
Janelew Tile Co., Janelew, W. Va.	Flatwoods, W. Va.	24.65		34.60		71.10		
E. Biglow Co. New London, Ohio	Waverly, W. Va.	19.05	25.05	32.00				
Elkins Brick and Tile Co., Elkins, W. Va.	Gassaway, W. Va.	19.55	26.75	33.50		70.00		
National Fire Proofing Co., Pittsburgh, Pa.	Spring Creek, W. Va.	26.00	34.00	42.50				
" " "	Kegley, W. Va.	27.48	36.60	48.80				
" " "	Huttonsville, W.Va	32.45	45.00	56.55		95.80		
Barboursville, W. Va. S. J. Johnson	Roncoverto, W. Va	23.30		41.95		65.25		
Robinson Clay Products Co., Akron, Ohio	Fairmont, W. Va.	27.95		48.75				
Kingsport, Va.	Duffield, Va.	20.00	35.00	45.00				
Joshua Oaks & Sons Co., Haverhill, Ohio	Cyrus, W. Va.	21.50	29.50	41.00				
S. T. Holt, Philippi, W. Va.	Philippi, W. Va.	19.00		29.00				

Reports Transmitted:

Staunton Experiment Farm, Augusta County, Va., by J. R. Haswell.

Reports Received:

Lindberger Tract, Canon City, Colo., by L. T. Jossup.
Ashley Hall Plantation, St. Andrews Parish, S.C., by F. G. Eason.
Taylor Farm, Richland Co., S. C., by F. G. Eason.
Broad Acre Ranch, Beaufort Co., N. C., by F. R. Baker.
Seepage Investigations in Illinois, by Q. C. Ayres.
Irrigated Farms Co., Tract, Mercer Co., N. Y., by J. R. Haswell.

OVERFLOWED LANDS

On February 19, F. G. Eason commenced a survey of lands in the proposed Walterboro Drainage District, Collector County, S. C.

On February 26, the Clear Boggy Creek, Oklahoma, camp was broken. Mr. Miller and Mr. Holmick, after arranging for suitable gagings stations, will return to the Office in the Federal Building, South Chicago, to prepare the report and plans. Mr. W. N. Hall has returned to Washington and Mr. R. L. Grable is again in the Alabama field.

Reports Transmitted:

Monroe Drainage District, Ouachita Parish, La., by O. G. Baxter.
Farilley Lake Levee District, Jefferson Co., Ark. by O. G. Baxter.

Reports Received:

Newman's Branch Drainage District, Sumter & Clarendon Cos., S. C. by S. W. Frescoln.
Moccasin Branch Drainage District, Bamberg Co., S. C. by S. W. Frescoln.
Kootenai River Bottoms, Bonnero Co., Idaho, by Lewis A. Jones and C. E. Ramser.
Big Clouds Creek Drainage District, Oglethorpe Co., Ga. by J. V. Phillips.

TIDAL MARSH

Reports Transmitted:

Hay Cut Meadow, Cumberland Co., N. J. by J. R. Haswell.

SWAMP LAND

Reports Transmitted:

Big and Little Alligator Swamps, Brunswick Co., N. C. by H. M. Lynde.

RUN-OFF INVESTIGATIONS.

C. E. Ramser is now stationed at Jackson, Tenn., from which place he will conduct run-off investigations, assisted by A. L. Lane.

Reports Transmitted:

Run-off investigations for Dredged Ditches in West Tenn., by C. E. Ramser.

COST, OPERATION AND MAINTENANCE.

P. T. Simons has been at the Washington Office since February 14, compiling the data on results of drainage construction which he secured during his field work of the past several months.

H. M. Lynde assisted by Guy L. Smith is preparing to make studies of maintenance of drainage ditches in Back and Jacob Swamps Drainage District, North Carolina. The following sections of ditches have been selected for preliminary studies:

Jacob Swamp: Main ditch, from station 200 to station 311+36.
Back Swamp: Main ditch, from station 762+00 to station 860+00.

The object of the work is to put the ditches along the portions selected in good order and to keep them in this order with a minimum annual expenditure. Considerable attention will be given also to the matter of getting small lateral ditches into the main ditch without bringing much sediment into the ditch and to devising cheap but efficient methods of letting water into the main ditches. Whenever possible timber growing along the ditches will be used in preference to sawed lumber.

ADDRESSES, CONFERENCES, INSPECTIONS, ADVICE, EXHIBITS AND LECTURES.

Addresses were made in February by the following Irrigation employees: L. M. Winser, Agent, at Logan, Utah, roundup, on Amount of Water to use at Single Irrigations, February 2, and Revision of Canal Systems and Economic Distribution of Water, February 3; Cedar City, Utah, roundup, on Measurement and Distribution of Irrigation Water and Irrigation of Wheat, February 9; Need of Construction of High Line Canals, February 10, and Preparation of Land for Irrigation and Proper Amount of Water to Use in a Single Irrigation, February 13; at Monroe, Utah, farmers' school, on Preparation of Land for Irrigation, February 16; at Richfield, Utah, on The Use of Water in Irrigation, February 16. R. A. Hart addressed the Utah Irrigation and Drainage Congress, spoke at Deseret, Utah, at a meeting which preceded the formation of a 17,200 acre drainage district, and conferred with several engineers, attorneys, and bond buyers regarding the

general drainage situation in Utah. V. M. Cone, I. E., delivered talks on measurement of water, duty of water, drainage and alkali reclamation under the auspices of the extension division of Colorado College, at Hochne, Colorado.

W. H. Lynch, S. H. E., was engaged for the principal portion of February in cooperating with the engineer of the new Highway Commission of Santa Cruz County, California, in the preparation of his report on a proposed bond issue.

L. I. Hewes, District Engineer, lectured before the Road School of the University of Idaho, February 26.

J. C. Wonders, District Engineer, made addresses at the State Road School, Manhattan, Kansas, Farm Congress, Chadron, Nebraska, and at the Iowa State Road Conference, Ames, Iowa.

J. D. Fauntleroy, District Engineer, has inspected county road systems and given local advice in a number of counties in Texas, including an inspection of the Fort Worth-El Paso Highway, and is having road systems and estimates prepared in several cases by Messrs. Burrell, Craig and Alderman.

W. A. Crossland, S. H. E., inspected the roads of Elmore County, Alabama, for the purpose of preparing a report on a county system.

F. A. Davis, J. H. E., completed the inspection and report of roads in Warren County, Kentucky, recommending a county system of highways.

H. C. Wells, S. R. C., completed a report for a county system of roads in Beaufort County, South Carolina, and on February 17 was assigned to make an inspection and prepare a report for a system of roads for Glynn County, Georgia. His address is Hotel Oglethorpe, Brunswick, Georgia.

G. D. Marshall, S. R. C., made an inspection of roads in Colleton County, South Carolina, and prepared a report for a system of main market roads.

W. F. Brooks, S. H. E., who has been at his home in Mankato, Minn., on sick leave, reported for duty February 21 to continue his work assisting the State Commissioner of Public Roads of Kentucky, with headquarters at Owensboro, Kentucky.

W. A. Crossland, S. H. E., inspected the road between Mobile, Alabama, and Meridian, Mississippi, and will report making recommendations in regard to the improvement of the same.

P. A. Rideout, J. H. E., assisted the State Highway Department of North Carolina at various points in that State.

D. H. Winslow, S. R. C., addressed board meetings at Oxford, North Carolina, on February 5, and at Durham, North Carolina, on February 6. From February 7 to 9 he delivered a series of lectures and gave road demonstrations at Elizabethtown, North Carolina.

W. L. Spoon, S. H. E., lectured at Rock Hill, South Carolina, at the request of the Automobile Association of that place. On February 12, 14 and 15, he delivered a series of lectures and gave road demonstrations at the Annual Road Institute at the University of North Carolina, Chapel Hill.

E. W. James, General Inspector, lectured on February 7 at the Road School at the University of Kentucky, Lexington, and on February 14 he lectured at the Annual Road Institute, University of North Carolina, Chapel Hill.

V. E. Towles, H. F., addressed a meeting of the Chamber of Commerce, Fayettoville, North Carolina, on February 27, in the interest of regulating automobile traffic.

From February 2-6, H. S. Yohe conferred with legislators and other citizens of West Virginia with reference to a bill which had been drafted as a drainage law for that State. On February 2, he appeared before the Judiciary Committee of the State House of Representatives for the purpose of explaining the various provisions of the bill. We are informed the bill was passed as submitted and has since been signed by the Governor.

On March 8, Lewis A. Jones started on a trip of inspection of the work in Florida.

On February 27, J. R. Haswell appeared before the County Commissioners of Worcester and Wicomico Counties, Maryland, with a view to working out a plan of cooperation between the commissioners and the proposed Pocomkoe Drainage District in Delaware.

J. J. Tobin attended the American Road Builders' Convention at Boston from February 4 to 9. This Office exhibited in a very favorable location the new concrete model showing the economical distribution of labor and materials for a two-bag mixer job, and ten other models showing the accepted standard construction of sand clay, gravel, macadam, bituminous macadam, bituminous concrete, and brick roads. Other models illustrating maintenance methods were on display. At the conclusion of the convention the models were requested by the Massachusetts Institute of Technology, to be used in connection with their highway engineering course. This request was granted by Mr. Page and the models are now on exhibition in the new Technology buildings at Cambridge, Mass.

A. R. Losh attended the Annual Conference of State and County Highway Officials of Tennessee at Knoxville on February 1 and 2. He addressed the conference on the subjects of "Economic Highways," "Highway Development," and "Cooperation of Federal and State Governments in Road Building."

A. S. Brainard addressed several road schools in Indiana, from January 28 to February 10, on the subjects, "Earth Road Construction and Maintenance" and "Gravel Road Construction." These schools were conducted by Purdue University for the instruction of county and township road officials, the public also invited. Lectures were given at the following places: Corydon, Evansville, Madison, Greensburg, New Castle, Huntington, Kokomo, Muncie, and Williamsport.

MEMORANDUM FOR EMPLOYEES IN THE FIELD.

The following decision has been rendered by the Auditor for the State and Other Departments with reference to the payment of tips to porters.

> "Voucher 121880, T. B. Hamilton. It will be necessary to disallow the 10 cents paid on May 4 to depot porter at Nashville, Tennessee, an anti-tipping State. The accounting officers cannot undertake to conduct an investigation into the precise terms of employment of station porters here and there. They must rest upon the broad fact that the service of such porters is ostensibly furnished by the transportation or terminal company; the fact that those who perform it may rely for compensation largely or wholly upon gratuities does not create between the porter and the traveler the relation of employer and employee."

For the information of all concerned, you are advised that the following states have passed laws prohibiting tipping within the States: Alabama, Arkansas, Iowa, Mississippi, South Carolina and Tennessee. In each of the above mentioned states a penalty is specified for anyone paying tips or fees, therefore it has been necessary to disallow such items of expense by this Office, and in the future no such claims should be submitted.

V. M. Cone, I. E., has submitted a brief report on the cost of automobile operation and maintenance in the Poudre Valley investigations during the 1916 season. The report follows:

The condition of the roads and the atmosphere will have some influence on the expense of operating the automobiles. We divided the seasons into winter and summer. The winter season consists of the months of February, March and April. During these months the roads are icy and rough. The summer season consists of the months of April, May, June, July August and September. During these months the roads are dry and smooth except two or three times a month, after a rain storm. After such storms the roads are usually dry and smooth in two or three days. The new automobiles were Ford roadsters purchased in February 1916. The second-hand automobiles were two Ford roadsters in fair condition, and one Ford touring car also in fair condition.

COST OF AUTOMOBILE OPERATION

The following list shows the running cost of the three new and the three second hand automobiles, for the summer months, May to September inclusive.

New Automobiles

	Cost per mile	
Gasoline	.0124	
Oil	.00163	
Tire repairs	.0011	3 Ford Roadsters - 1916 Model
Materials	.0014	
Garage Labor	.00051	
Our Labor	.0029	
Tire Casings	.00555	
Tire tubes	.00082	
Total	.02631	

Second-hand Automobiles

Gasoline	.0129	
Oil	.00231	
Tire repairs	.00065	2 - used Ford Roadsters
Materials	.00510	1 - " " Touring Car.
Garage labor	.00230	
Our labor	.00220	
Tire casings	.00720	
Tire tubes	.00082	
Total	.03348	

Kind of car	Average mileage per month	Average mileage per day	Miles per gall of gasolin
New	1668	56.3	22.1
Second-hand	1771	60.5	21.5

The price of gasoline in the Poudre Valley in 1916 ranged from 24 to 28 cents per gallon, with an average of 27 cents.

The average price of engine oil was about $.55 per gallon.

The interest and depreciation is not included in this cost because it is unfair to figure depreciation on cars for the one season, with first cost and probable sale value as basis. The depreciation can be more reliably estimated at the end of the second season.

Garage rent was not included because this will vary with every case.

The following list shows the running cost of the six automobiles, three of which are new and three second-hand, for the winter months, February to April inclusive:

Item	Cost per mile
Gasoline	.0148
Oil	.0018
Tire Repairs	.00088
Materials and sundries	.0017
Tire casings	.0064
Our labor	.0020
Tire tubes	.00082
Total	.02840

The price of gasoline in the Poudre Valley during the winter months of the year 1916 remained at 28 cents per gallon.

The average price of engine oil was about $.55 per gallon.

The interest, depreciation and garage rent was not included.

The Average for the Season 1916.

Number of casings	Average miles per wheel.	cost per casing	Average cost of repairs per casing	Cost per wheel per mile without repairs.
		Firestone Gray Sides 30" x 3"		
4	9140	$10.35	None	.00113
		Firestone Gray Sides 30" x 3½"		
2	9193	$13.10	$0.75	.00143
		Firestone Non Skid 30" x 3½"		
4	6397	$14.70	$0.88	.0023
		Firestone Red Sides 30" x 3½"		
3	7278	$9.68	$0.25	.00133
		Goodrich 30" x 3"		
2	7716	$9.90	$2.75	.0013
		Goodrich 30" x 3½"		
2	11717	$13.00	$1.75	.0011